consumer preferences evolve, and on the business strategies of providers that offer both wireless and wireline Internet access services.[1073] Mobile wireless Internet access service could provide an attractive alternative to wireline offerings for consumers who are willing to trade off speed for mobility, and also consumers who are relatively indifferent with regard to the attributes, performance, and pricing of mobile and fixed platforms.[1074] Moreover, while mobile wireless service currently is not competitive with wireline for those consumers who value high speeds over other attributes, advances in wireless technologies, coupled with increases in the supply of spectrum, have the potential to make mobile wireless service a more viable competitor at higher data speeds at some future date.[1075]

C. Local Wireless Networks

368. Wireless coverage is being increased with technologies that create local wireless networks, some accessing primary voice and data networks through cable access points instead of mobile wireless networks. These local-network wireless technologies typically are designed to provide wireless coverage in a specific local area, such as a commercial or residential building, or a neighborhood. They offer consumers and service providers a convenient means to extend or improve wireless coverage at targeted indoor and outdoor locations. Local wireless networks that employ unlicensed spectrum (discussed below) can operate independently of a mobile wireless service network, raising questions about whether they can, by themselves or integrated into non-mobile wireless networks, create new competition to mobile wireless service providers.

369. When deployed to complement mobile wireless networks, local-network wireless technologies may offer solutions to network congestion problems that mobile wireless providers are facing with increasing frequency. Rapid growth in mobile data traffic, an estimated 40 percent of mobile wireless usage occurring in the home,[1076] and a large demand for wireless data by mobile users sojourning at public locations give incentives for service providers to find means, potentially intermodal, to reduce congestion on their mobile wireless networks. Local wireless networks that access data and voice networks through cable access points enable mobile wireless service providers to offload mobile traffic onto non-mobile wireless networks.[1077]

370. The roles that local wireless networks play in existing telecommunication networks are a dynamic and developing segment of the telecommunications sector. Local wireless networks complement existing cable and wireless networks, exemplifying how next generation communication networks efficiently connect together multiple co-existing transmission technologies. Two local wireless network technologies, wireless local area networks (WLANs) and femtocells, are discussed below.

[1073] *National Broadband Plan*, at 42; *National Broadband Plan*, at 42-44; U.S. Department of Justice *Ex Parte*, GN Docket No. 09-51 (filed Jan. 4, 2010), at 8, 10, 11.

[1074] *National Broadband Plan*, at 43 and 64, note 3; *National Broadband Plan*, at 42-44; U.S. Department of Justice *Ex Parte*, GN Docket No. 09-51 (filed Jan. 4, 2010), at 8.

[1075] *National Broadband Plan*, at 43.

[1076] *See*, W. Gerhardt and R. Medcalf, *Femtocells: Implementing a Better Business Model to Increase SP Profitability*, Cisco, March 2010.

[1077] In September, 2010, the Commission finalized rules to make unused spectrum in the TV bands (TV "white spaces") available for unlicensed broadband wireless devices. Access to this spectrum could enable more powerful public Internet connections – super Wi-Fi hot spots – with extended range, fewer dead spots, and improved individual speeds resulting from reduced congestion on existing networks. *See* Unlicensed Operation in the TV Broadcast Bands, *Second Memorandum Opinion and Order*, ET Docket Nos. 04-186, 02-380, 2010 WL 3726622 (rel. Sept. 23, 2010) at ¶ 1.

371. WLANs operate on an unlicensed basis and provide high-speed (fixed) wireless Internet connections within a range of 150 to 250 feet from a wireless access point.[1078] Peak WLAN data transfer rates range from speeds of up to 11 Mbps for 802.11b, up to 54 Mbps for 802.11a and 802.11g, and up to 600 Mbps for 802.11n. The most prevalent WLAN technology is equipment manufactured in accordance with the IEEE 802.11 family of standards, commonly known as "Wi-Fi". Wi-Fi networks can access the internet through telecommunication cables or cellular networks. Users can access Wi-Fi networks with Wi-Fi enabled wireless handsets, as well as other Wi-Fi capable devices such as the Amazon Kindle, the Apple iPad, and the Barnes & Noble Nook.[1079]

372. WLAN networks are being deployed by mobile wireless companies, cable companies, businesses, universities, municipalities, households and other institutions.[1080] WLAN networks, sometimes called "hotspots," have proliferated in places accessible to the public such as restaurants, coffee shops, malls, train stations, hotels, airports, convention centers, and parks.[1081] Many places of businesses offer Wi-Fi hot spots to their customers.[1082] Amtrak offers Wi-Fi access on all of its Acela Express trains between Washington, DC and Boston.[1083] According to one report, the top ten U.S. airlines have all begun deploying in-flight Wi-Fi and about 2,000 commercial aircraft will offer this service by the end of 2010, up from about 700 at the end of 2009.[1084] In November 2010, the communication company Comcast served its customers with 21,629 hotspots and is deploying more.[1085] Online Wi-Fi directories assist consumers in finding public Wi-Fi hot spots.[1086]

[1078] Services provided over WLANs are not CMRS services. *See* 47 C.F.R. §§ 20.3, 20.9 for a discussion of commercial mobile radio services. WLANs are permitted to operate on an unlicensed basis under Part 15 of the Commission's rules. *See* 47 C.F.R. §15, et seq.

[1079] CTIA Reply at 27.

[1080] Nat Worden, *Cable Companies Reach Wi-Fi Pact*, Wall Street Journal, Apr. 15, 2010. Cablevision, Comcast and Time Warner have deployed thousands of Wi-Fi hot spots, with Cablevision alone investing $300 million on Wi-Fi network deployment and averaging more than two million Wi-Fi sessions a month on its network. *Id.* In addition, the three companies have agreed to allow their broadband Internet subscribers to roam freely across the Wi-Fi deployments of all three major cable operators in the New York metro area. *Id.*

[1081] *See Seventh Report*, 17 FCC Rcd at 13062-13063. Hot spots typically rely on high-speed landline technologies, such as T-1 lines, DSL, or cable modems, to connect to the Internet.

[1082] *See Wi-Fi Hotspots Stay Hot In 2008,* Cellular-News.com, July 17, 2008. ABI Research Vice President and Research Director, Stan Schatt stated, "Starbucks' decision to go to a virtually free Wi-Fi hotspot model is having a profound impact. Hotspot owners are beginning to see Wi-Fi as a cost of doing business and an operation expense, rather than as a profit center." *Id.*

[1083] Verizon Wireless Comments at 30; *see generally* Amtrak, *AmtrakConnect Wi-Fi*, http://www.amtrak.com/servlet/ContentServer/AM_Content_C/1246044325520/1237405732514 (visited Sept. 16, 2010).

[1084] *See* In-Stat, *Build It and They Will Come? The In-Flight Broadband Market*, July 2010, *available at* http://www.instat.com/mp/10/IN1004767WS_Sample.pdf; Danny King, *WiFi in the Sky: Airlines Bring More Internet Access on Board*, DAILY FINANCE, Aug. 28, 2010, *available at* http://www.dailyfinance.com/story/wifi-airplanes-airlines-internet/19611600/. Aircell, the industry leader in providing in-flight Wi-Fi access, typically offers service starting at $4.95 per flight and up depending on the device used and the duration of the flight. *Id.*

[1085] *See* Comcast, http://comcast.cellmaps.com/wifi.html, visited November 16, 2010.

[1086] *See* Hotspotr, *WiFi Cafes and Hotspots*, *available at* http://hotspotr.com/wifi (17,528 hot spots) (visited Sept. 15, 2010); Jiwire, *Global Wi-Fi Finder*, *available at* http://v4.jiwire.com/search-hotspot-locations.htm (visited Sept. 15, 2010) (77,780 hot spots in the United States).

373. Mobile wireless service providers AT&T, Verizon Wireless, and T-Mobile each currently offer wireless internet access at thousands of publicly accessible Wi-Fi hotspot locations.[1087] AT&T owns more than 23,000 Wi-Fi hotspots in the United States.[1088] Through agreements with AT&T, national chains such as Starbucks, McDonald's, and Barnes & Noble offer complimentary Wi-Fi access in their establishments.[1089] Verizon has more than 16,000 hotspots.[1090] Borders signed an agreement with Verizon for Verizon to provide free Wi-Fi access in more than 500 of Borders' stores nationwide.[1091] AT&T, T-Mobile, and Verizon Wireless include Wi-Fi hot spot access with some mobile wireless service plans.[1092] Whereas Verizon Wireless's hot spot access requires a monthly broadband plan, AT&T and T-Mobile offer Wi-Fi hot spot access on a per session or per day basis.[1093] Other mobile wireless providers

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[1087] *See* AT&T, *AT&T Wi-Fi: At a Glance,* http://www.att.com/Common/about_us/files/pdf/wifi/Wi-Fi_at_a_Glance.pdf (visited Sept. 16, 2010) (advertising the nation's largest Wi-Fi network, with more than 20,000 locations in all fifty states); Verizon Wireless, *Verizon Wi-Fi Hotspot Directory,* http://vzw.jiwire.com/ (visited Sept. 16, 2010) (listing more than 12,000 Verizon Wi-Fi hot spots across the United States); T-Mobile, *T-Mobile HotSpot Locations,* https://selfcare.hotspot.t-mobile.com/locations/viewLocationMap.do (visited Sept. 16, 2010) (advertising over 10,000 locations in the United States). *See generally* AT&T, *AT&T Wi-Fi,* http://www.att.com/gen/general?pid=5949 (visited Sept. 16, 2010); T-Mobile, *Wireless Internet Access – T-Mobile HotSpots,* https://content.hotspot.t-mobile.com/AssetProcess.asp?asset=com.default.main.001 (visited Sept. 16, 2010); Verizon Wireless, *Hit the Hotspots with Verizon Wi-Fi,* https://www.verizonwireless.com/b2c/mobilebroadband/?page=wifiaccess (visited Sept. 16, 2010).

[1088] *See AT&T Media Kit: Wi-Fi,* http://www.att.com/gen/press-room?pid=17541 (visited Sept. 29, 2010). In the second quarter of 2010, AT&T handled 68.1 million connections on its public Wi-Fi network, compared to 15 million connections during the same period in 2009. In total, AT&T customers made 121.2 million connections in the first half of 2010, surpassing the 85.5 million connections made in all of 2009. *Use of AT&T's Wi-Fi Network Grows to More Than 68 Million Connections in the Second Quarter*, Press Release, AT&T, July 22, 2010.

[1089] *See* Starbucks, *Wireless Internet*, http://www.starbucks.com/coffeehouse/wireless-internet (visited Sept. 16, 2010) (advertising free, unlimited Wi-Fi access, with no username or password required, at all Starbucks company-owned stores in the United States); McDonald's, *Free Wi-Fi,* http://www.mcdonalds.com/us/en/services/free_wifi.html (visited Sept. 16, 2010) (advertising free Wi-Fi hot spot access at more than 11,500 locations in the United States); Barnes & Noble, *AT&T Wi-Fi,* http://www.barnesandnoble.com/u/Wi-fi-at-Barnes-and-Noble/379001240/?cds2Pid=27242&linkid=1594157 (visited Sept. 16, 2010).

[1090] *See* Verizon, *Wi-Fi Access HotSpot Directory*, http://www.verizon.com/hotspots (visited Nov. 17, 2010).

[1091] *Borders Signs Agreement with Verizon to Offer Free Wi-Fi,* PR NEWSWIRE, Sept. 29, 2009, *available at* http://www.prnewswire.com/news-releases/borders-signs-agreement-with-verizon-to-offer-free-wi-fi-62675172.html (visited Sept. 16, 2010); *see also* Borders, *Customer Care Borders Stores*, http://www.borders.com/online/store/CustomerServiceView_storeinfo#wifi (visited Sept. 16, 2010).

[1092] *See* AT&T, *AT&T Wi-Fi: At a Glance,* http://www.att.com/Common/about_us/files/pdf/wifi/Wi-Fi_at_a_Glance.pdf (visited Sept. 16, 2010) (stating that "[u]nlimited access to AT&T Wi-Fi hotspots in the U.S. is included for millions of residential, small business and enterprise customers with select AT&T High Speed Internet, LaptopConnect, and smartphone plans"); Verizon Wireless, *Hit the Hotspots with Verizon Wi-Fi,* https://www.verizonwireless.com/b2c/mobilebroadband/?page=wifiaccess (visited Sept. 16, 2010) (stating that Verizon Wi-Fi is "included for our Mobile Broadband customers."); T-Mobile, *T-Mobile Hotspot – Service Plans,* https://selfcare.hotspot.t-mobile.com/services_plans.do (visited Sept. 16, 2010) (advertising $9.99 per month as a "discount for T-Mobile voice plan customers only").

[1093] *See* Verizon Wireless, *Hit the Hotspots with Verizon Wi-Fi,*https://www.verizonwireless.com/b2c/mobilebroadband/?page=wifiaccess (visited Sept. 16, 2010); AT&T, *AT&T Wi-Fi: At a Glance,* http://www.att.com/Common/about_us/files/pdf/wifi/Wi-Fi_at_a_Glance.pdf (visited Sept. 16, 2010) (stating that "[o]ne-time hot spot connections are available for as low as $2.95 for two hours"); T-Mobile, *T-Mobile Hotspot – Service Plans,* https://selfcare.hotspot.t-mobile.com/services_plans.do (visited Sept. 16, 2010) (advertising a "DayPass" plan with no term commitment).

sell customers personal mobile Wi-Fi hotspots (discussed below) that access the providers' respective wireless networks.[1094]

374. Some mobile wireless service providers use WLANs to complement the coverage of their mobile wireless networks. AT&T has recently deployed "hotzone" pilot programs in New York City, Charlotte, North Carolina, and Chicago, Illinois using Wi-Fi to provide an additional mobile broadband option in areas of each city that experience consistently high mobile data use.[1095] AT&T has experienced significant growth in hot spot usage in the first half of 2010,[1096] with an estimated 40 percent of iPhone traffic in the United States being transmitted over a Wi-Fi connection.[1097] T-Mobile and Cincinnati Bell Wireless offer Wi-Fi-based services – "T-Mobile@Home" and "Fusion WiFi," respectively – that provide improved, in-building voice coverage and unlimited calling through a specified home or office Wi-Fi router or at provider-branded hot spot locations. According to T-Mobile, as of October 2010, its Wi-Fi hotspots transmit approximately 40 million calls per month.[1098]

375. To facilitate access of mobile wireless users to their Wi-Fi hotspots, a number of mobile wireless providers now offer dual-mode handsets that operate on both cellular and Wi-Fi networks.[1099]

[1094] Sprint Nextel sells mobile Wi-Fi devices that connect up to five devices. *See* Sprint Nextel http://shop.sprint.com/NASApp/onlinestore/en/Action/DisplayPhones?phoneSKU=SWW8013G4G (visited Nov. 17, 2010). Clearwire, Clearwire Announces Nationwide Availability of 4G/Wi-Fi Personal Mobile Hotspots, http://newsroom.clearwire.com/phoenix.zhtml?c=214419&p=irol-newsArticle&ID=1445088&highlight (visited Nov. 17, 2010).

[1095] *See AT&T Launches Wi-Fi Hotzone in Chicago*, Press Release, AT&T, Aug. 4, 2010; *AT&T Expands Wi-Fi Hotzone Pilot Project to Additional Cities*, Press Release, AT&T, July 26, 2010; *AT&T Launches Pilot Wi-Fi Project in Times Square*, Press Release, AT&T, May 25, 2010. AT&T installed Wi-Fi service in the north central portion of New York City's Times Square as well as along part of South Brevard Street in Charlotte, NC and in the Wrigleyville neighborhood around Wrigley Field in Chicago. *Id.* The service is available at no additional charge for nearly 32 million AT&T customers with qualifying smartphone, 3G LaptopConnect, and AT&T High Speed Internet plans. *Id.*

[1096] *See AT&T Media Kit: Wi-Fi*, http://www.att.com/gen/press-room?pid=17541 (visited Sept. 29, 2010). In the second quarter of 2010, AT&T handled 68.1 million connections on its public Wi-Fi network, compared to 15 million connections during the same period in 2009. In total, AT&T customers made 121.2 million connections in the first half of 2010, surpassing the 85.5 million connections made in all of 2009. *Use of AT&T's Wi-Fi Network Grows to More Than 68 Million Connections in the Second Quarter*, Press Release, AT&T, July 22, 2010.

[1097] *See* AdMob Mobile Metrics Report (Nov. 2009), *available at* http://metrics.admob.com/wp-content/uploads/2009/12/AdMob-Mobile-Metrics-Nov-09.pdf, (visited Sept. 17, 2010) at 3 (stating that 36 percent of U.S. iPhone traffic is transmitted via Wi-Fi); *see also* AdMob Mobile Metrics Report (Nov. 2008), *available at* http://www.admob.com/marketing/pdf/mobile_metrics_nov_08.pdf, at 2 (stating that 42 percent of iPhone traffic was transported over Wi-Fi).

[1098] *T-Mobile Extends Wi-Fi Calling to Android*, Press Release, T-Mobile, Oct. 6, 2010. In October 2010, T-Mobile announced the upcoming availability of built-in Wi-Fi calling solutions for its smartphones using the Android OS. *Id.*

[1099] *Wi-Fi in Mobile Phones: Dual Mode Becomes the Thing*, In-Stat, Nov. 2009. *See, e.g.*, AT&T, *Cell Phones & Devices – Wireless from AT&T*, http://www.wireless.att.com/cell-phone-service/cell-phones/cell-phones.jsp?feacondition=allphones&feapaytype=standard&startFilter=%20false&allTypes=on&feawifiCapable=wifiCapable&allManus=on (visited Sept. 17, 2010) (listing 27 Wi-Fi capable phones or devices from AT&T); T-Mobile, *HotSpot Phones: Talk Away!*, http://www.t-mobile.com/templates/ListAllPhones.aspx/?features=4ce9c948-6b53-4b76-a3f7-9116f33bd25b&WT.mc_n=TMHSDevice_WiFiLP&WT.mc_t=Offsite (visited Sept. 17, 2010) (listing 9 handsets available to use with T-Mobile's Unlimited HotSpot Calling service, which allows for unlimited nationwide calls over Wi-Fi); US Cellular, *US Cellular – Phones*, http://www.uscellular.com/uscellular/zipCode.jsp?type=phones&call=0 (visited Sept. 17, 2010) (Wi-Fi capable handsets from US Cellular can be found by entering a zip code for a valid service area and applying the filter for "Wi-Fi" to the list of available handsets); Cincinnati Bell Wireless, *Cincinnati Bell Wireless Phones and Devices*, (continued....)

According to one report, the number of Wi-Fi equipped mobile phones that shipped in 2009 increased to 139.3 million, up from 92.5 million in 2008.[1100] With the increasing prevalence of Wi-Fi enabled handsets, such as the iPhone, hotspot usage by handsets has increased significantly.[1101] According to one study, handsets accounted for 35 percent of all hotspot connections in 2009, up from 20 percent in 2008, and are projected to account for half of all hotspot connections by 2011.[1102] AT&T reports that 69 percent of its Wi-Fi connections in the first quarter of 2010 were made from smartphones and integrated devices, up from 35 percent in the first quarter of 2009.[1103]

376. A femtocell is a microcell – a small wireless transmitter that functions similar to a cell in a mobile wireless network – that uses the service provider's licensed spectrum and accesses voice and data networks through a DSL or cable access point. Femtocells are compatible with the same mobile handsets that consumers use on the service provider's mobile wireless network. Typically, calls can be handed-off from the femtocell to the provider's mobile wireless network, but not vice-versa. Approximately 350,000 femtocells were shipped in 2009.[1104] One report estimates that over one million femtocells will be shipped in 2010.[1105] Another report states that adoption of femtocells has been hindered by customer reluctance to incur additional costs and service provider indecision over the best business strategies to cope with current and projected increases in mobile traffic.[1106] Three nationwide service providers distribute and support femtocells in selected markets. Sprint Nextel's femtocell service, called Airave™, was introduced in 2008 and allows subscribers to make unlimited wireless calls from their femtocell network for a monthly service fee.[1107] The Verizon Wireless Network Extender, unveiled in January 2009, is designed to enhance indoor coverage and be used with a customer's existing service

(Continued from previous page)
http://www.cincinnatibell.com/consumer/wireless/phones_and_devices/?view=fusionwifi (visited Sept. 17, 2010) (listing four handsets available for use with Cincinnati Bell Wireless' Fusion WiFi service).

[1100] *See* Stephen Lawson, *Wi-Fi Spreading Fast Among Phones*, PCWORLD, Mar. 23, 2010, *available at* http://www.pcworld.com/article/192106/wifi_spreading_fast_among_phones.html.

[1101] *See* AdMob Mobile Metrics Report (Nov. 2009), *available at* http://metrics.admob.com/wp-content/uploads/2009/12/AdMob-Mobile-Metrics-Nov-09.pdf (visited Sept. 17, 2010). According to the study, the percentage of mobile advertising requests from devices with Wi-Fi capability increased from 19 percent to 55 percent between November 2008 and November 2009. In addition, the percentage of requests over a Wi-Fi network in the United States tripled – from 8 percent to 24 percent – during the same period. *Id.* at 3.

[1102] *Hotspot Usage Is Increasingly Shifting Away From Notebooks and Laptops and Toward Handhelds*, Press Release, In-Stat, Dec. 23, 2009.

[1103] *AT&T Wi-Fi Network Usage Soars to More Than 53 Million Connections in the First Quarter*, Press Release, AT&T, Apr. 22, 2010.

[1104] *2009 Femtocell Shipment Numbers Cut by 55%*, Press Release, ABI Research, Nov. 12, 2009.

[1105] In-Stat, quoted in The New York Times, *Network Congestion Lifts Home 3G Station Market*, November 15, 2010.

[1106] *See*, W. Gerhardt and R. Medcalf, *Femtocells: Implementing a Better Business Model to Increase SP Profitability*, Cisco, March 2010. *See* AT&T, *AT&T 3G Microcell*, http://www.wireless.att.com/learn/why/3gmicrocell/ (visited Nov. 15, 2010).

[1107] Sprint Nextel, *Sprint Airave*, http://shop.sprint.com/en/services/airave/index.shtml (visited Sept. 17, 2010). Customers pay $99.99 to purchase the Airave base station plus a $4.99 per month enhanced coverage charge as well as an optional monthly fee of $10 per line for unlimited calling. *Id. See also* Sprint Nextel, *Airave Frequently Asked Questions*, at 3, http://www.nextel.com/assets/pdfs/en/services/sprint_airave_faqs.pdf (visited Sept. 17, 2010). The Airave includes voice, not data, services. *Id.* at 3.

plan.[1108] The AT&T 3G MicroCell, introduced in late 2009,[1109] is also used with a customer's existing service plan.[1110]

377. Several mobile wireless providers have also introduced personal mobile (i.e. portable) Wi-Fi hotspots that access the Internet through the provider's mobile wireless network. For instance, the Sprint Personal Hotspot PHS300S tethers to Sprint Nextel USB modems to provide Wi-Fi access anywhere within Sprint Nextel's mobile broadband coverage.[1111] The Novatel Wireless MiFi 2200, available to both Verizon Wireless and Sprint Nextel customers, is "about the size of eight stacked credit cards" and supports up to five Wi-Fi enabled devices.[1112] Additionally, Sprint Nextel has introduced the Overdrive 3G/4G Mobile Hotspot by Sierra Wireless, which functions similarly to the MiFi 2200 but also includes access to 4G data speeds.[1113] In July of 2009, Novatel Wireless unveiled the MiFi 2372 HSPA, a newer version of its Intelligent Mobile Hotspot with multi-mode operation, including HSPA, UMTS, EDGE and GPRS.[1114] Additionally, in August 2010, Cricket announced that it will be offering Crosswave, a personal hot spot device that allows users to connect several wireless devices at the same time from up to 30 feet away from the Crosswave device's location.[1115]

[1108] *See Verizon Wireless "Network Extender" Enhances In-Home Call Capabilities*, Press Release, Verizon Wireless, Jan. 26, 2009. *See also* Verizon Wireless, *Verizon Wireless Network Extender,* http://www.verizonwireless.com/b2c/store/accessory?action=gotoFeatures (visited Sept. 17, 2010). Customers pay $249.99 for the Network Extender base station but pay no additional monthly access fee. *Id. See also* Verizon Wireless, *Answers to FAQs,* http://support.vzw.com/faqs/Equipment/network_extender.html (visited Sept. 17, 2010). The Network Extender does not support EVDO data speeds. *Id.*

[1109] *See* Prince McLean, *AT&T MicroCell to Cost $150, Require No Monthly Fee,* AppleInsider, Sept. 21, 2009, *at* http://www.appleinsider.com/articles/09/09/21/att_3g_microcell_to_cost_150_require_no_monthly_fees.html. Under AT&T's trial pricing, AT&T wireless customers pay $20 per month for unlimited calling with the 3G Microcell, while AT&T landline phone or Internet customers pay $10 per month, and customers with all three services can use the device for free. *Id.*

[1110] *See* AT&T, *AT&T 3G MicroCell,* http://www.wireless.att.com/learn/why/3gmicrocell/ (visited Sept. 17, 2010). The AT&T 3G MicroCell supports 3G data speeds. *Id.*

[1111] Sprint Nextel, *Sprint Personal Hotspot PHS300S,* http://shop.sprint.com/en/solutions/mobile_broadband/personal_hotspot.shtml (visited Sept. 17, 2010). The Sprint Personal Hotspot PHS300S currently sells for $159.99. *Id.*

[1112] Verizon Wireless, *Verizon Wireless – Mobile Broadband – Products,* http://www.verizonwireless.com/b2c/mobilebroadband/?page=products_mifi(visited Sept. 17, 2010); Sprint Nextel, *Info on the MiFi™ 2200 by Novatel Wireless,* http://support.sprint.com/support/device/Novatel_Wireless/MiFi_2200_by_Novatel_Wireless-novatel_2200, (visited Nov. 8, 2010).

[1113] *See* Sprint Nextel, *Overdrive™ 3G/4G Mobile Hotspot by Sierra Wireless,* http://shop.sprint.com/NASApp/onlinestore/en/Action/DisplayPhones?phoneSKU=SWW8013G4G&id16=overdrive (visited Sept. 17, 2010).

[1114] *Novatel Wireless Announces MiFi 2372 Intelligent Mobile Hotspot Optimized for North American HSPA Broadband Networks*, BUSINESS WIRE, July 28, 2009, *available at* http://www.businesswire.com/portal/site/home/permalink/?ndmViewId=news_view&newsId=20090728005338&newsLang=en (visited Sept. 17, 2010).

[1115] *Cricket Announces New Device Lineup*, Press Release, Cricket Wireless, Aug. 3, 2010.

IX. URBAN-RURAL COMPARISONS

378. Since the release of the *Sixth Report,*[1116] the Commission has attempted to obtain a better understanding of the state of competition below the national level, and particularly in rural areas. The Communications Act does not include a statutory definition of what constitutes a rural area.[1117] The Commission used Rural Services Areas (RSAs) as a proxy for rural areas for certain purposes, such as the former cellular cross-interest rule and the former CMRS spectrum cap, stating that "other market designations used by the Commission for CMRS, such as [EAs], combine urbanized and rural areas, while MSAs and RSAs are defined expressly to distinguish between rural and urban areas."[1118] Since its 2004 *Report and Order* concerning deployment of wireless services in rural areas, however, the Commission has adopted a "baseline" definition of rural as a county with a population density of 100 persons or fewer per square mile.[1119] For this reason, we adopt this same definition to analyze service availability in rural areas in this *Report.*

379. By this definition, roughly 61 million people, or 21 percent of the U.S. population, live in rural counties. These counties comprise 3.1 million square miles, or 86 percent of the geographic area of the United States.[1120] The distribution of rural counties across the United States can be seen in Map 4 below. Approximately 79 percent of the U.S. population lives on 14 percent of the land, while 21 percent live on the remaining 86 percent of the land.

[1116] *Sixth Report*, 16 FCC Rcd at 13350.

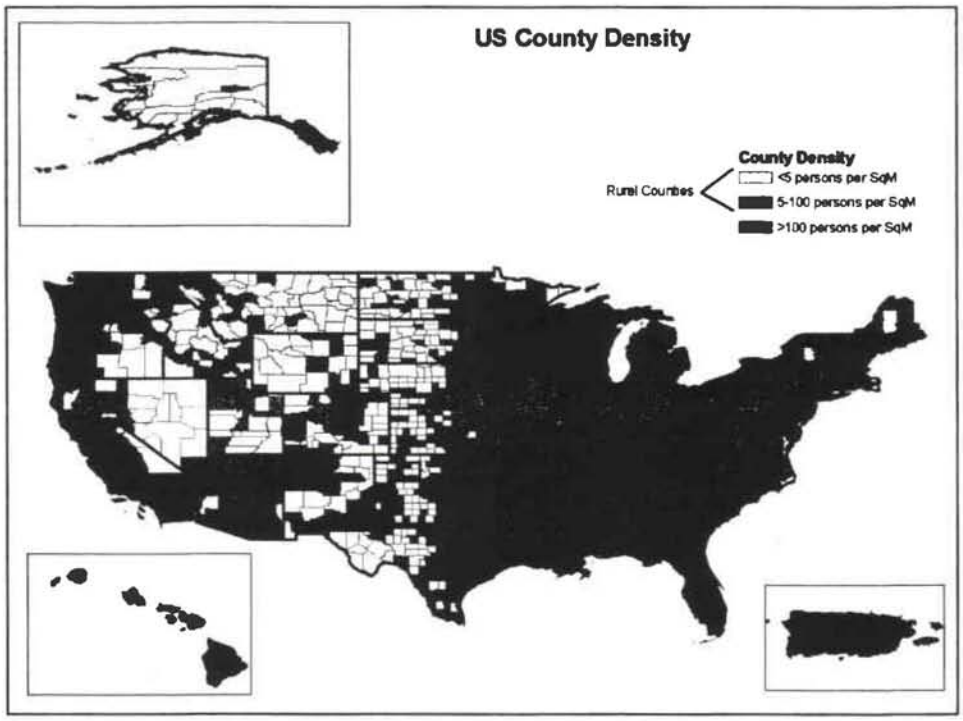
[1117] The federal government has multiple ways of defining rural, reflecting the multiple purposes for which the definitions are used. *Eighth Report*, 18 FCC Rcd at 14834; Facilitating the Provision of Spectrum-Based Service to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services, *Notice of Proposed Rulemaking*, 18 FCC Rcd 20802, 20808-11 (2003).

[1118] 1998 Biennial Regulatory Review, Spectrum Aggregation Limits for Wireless Telecommunications Carriers, *Report and Order*, 15 FCC Rcd 9219, 9256 ¶ 84, n.203 (1999).

[1119] Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services, *Report and Order*, 19 FCC Rcd. 19078, 19087-88 (2004) ("We recognize, however, that the application of a single, comprehensive definition for 'rural area' may not be appropriate for all purposes. . . . Rather than establish the 100 persons per square mile or less designation as a uniform definition to be applied in all cases, we instead believe that it is more appropriate to treat this definition as a presumption that will apply for current or future Commission wireless radio service rules, policies and analyses for which the term 'rural area' has not been expressly defined. By doing so, we maintain continuity with respect to existing definitions of 'rural' that have been tailored to apply to specific policies, while also providing a practical guideline").

[1120] Including the populations of Puerto Rico and the Virgin Islands.

Map 4
County Density in the United States[1121]



380. Using American Roamer data, we have analyzed mobile wireless network coverage in rural areas.[1122] We note that these data reflect network coverage, rather than the number of providers offering service to consumers living in these areas. Table 40 shows that 99.2 percent of the U.S. rural population has coverage by at least one mobile wireless service provider, which is slightly lower than the percentage of the entire U.S. population, 99.6 percent, with coverage by at least one service provider.[1123] Just over 500,000 people in rural areas had no mobile wireless coverage as of July 2010, down from just over 900,000 in October 2009. The rural population with coverage by only one provider fell from 2.5 million in October 2009 to approximately 1.6 million in July 2010. Over 96 percent of the rural population was covered by at least two providers in July 2010 compared to 94.5 percent in October 2009.[1124] Further, 88.4 percent was covered by at least three providers and 77.4 percent by at least four

[1121] A larger version of this map may be found in Appendix D.

[1122] We note that American Roamer likely overstates the coverage actually experienced by consumers, because it reports advertised coverage as reported to it by many wireless service providers, each of which uses a different definition of coverage. The data do not expressly account for factors such as signal strength, bit rate, or in-building coverage, and may convey a false sense of consistency across geographic areas and service providers but nonetheless are useful for benchmarking mobile network deployment across the United States, especially over time. *National Broadband Plan*, at 39 (Chapter 4).

[1123] *See* Section III.C.1, Number of Competitors, *supra*. There are 8 million census blocks in the United States, where a census block is the smallest geographic area for which population data are available. Note we consider a census block to be covered even if only a portion of the block has mobile wireless coverage. Further, different service providers may provide coverage in different areas within a census block. Any over counting of coverage may be accentuated in rural areas where census blocks are larger. *See* RTG PN Comments, at 6.

[1124] *See Thirteenth Report*, 24 FCC Rcd at 6239, ¶ 104.

providers in July 2010, compared to 83.1 and 65.5 percent respectively in October 2009. Overall network coverage in rural areas has increased since the *Fourteenth Report*. However, there remains a disparity in rural coverage (see Chart 48). The percentage of the rural population with coverage by one or more or two or more providers (99.2 percent and 96.6 percent respectively) is comparable to coverage for the entire U.S. population,[1125] but the coverage gap widens as the number of service providers increases.

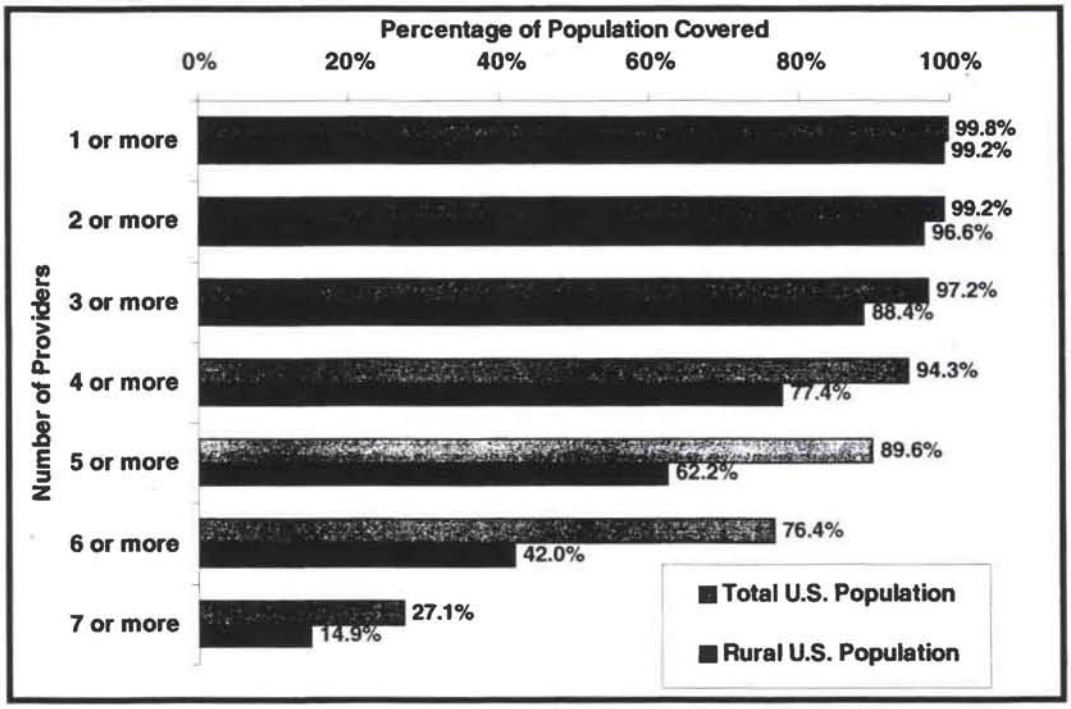
Table 40
Estimated Mobile Voice Coverage in Rural Areas by Census Block[1126]

Total Number of Providers with Coverage in a block	*Number of Rural Census Blocks*	*POPs Contained in Rural Census Blocks*	*% of Total U.S. POPs*	*Square Miles Contained in Those Blocks*	*% of Total U.S. Square Miles*
Total for Rural U.S.	*4,169,790*	*60,836,650*	*21.3%*	*3,367,687*	*88.6%*
			% of Total Rural U.S. POPs		*% of Total Rural U.S. Square Miles*
1 or More	3,995,938	60,321,254	99.2%	2,408,065	71.5%
2 or More	3,723,236	58,739,413	96.6%	1,942,219	57.7%
3 or More	3,190,052	53,792,178	88.4%	1,461,559	43.4%
4 or More	2,534,278	47,098,092	77.4%	969,740	28.8%
5 or More	1,826,229	37,825,370	62.2%	578,163	17.2%
6 or More	1,089,048	25,523,263	42.0%	291,328	8.7%

[1125] *See* Table 5 in Section III.C.1, Number of Competitors, *infra*, for the nationwide analog of Table 40.

[1126] Commission analysis, using American Roamer database, July 2010, and Census 2000 population figures. The square miles include the United States and Puerto Rico. There are approximately 8 million census blocks and 300 million people in the entire United States (based on the 2000 Census).

Chart 48
Mobile Voice Coverage in Rural Areas



381. Looking at mobile broadband service, Table 41 and Chart 49 below show the extent of mobile broadband network coverage in rural areas and the disparity between coverage in rural areas versus the entire United States.[1127] Based on a census block analysis of August 2010 American Roamer data, 94 percent of the U.S. rural population has coverage by at least one mobile wireless broadband provider, up from 92 percent in November 2009. In contrast, 99 percent of the total U.S. population is covered by at least one mobile broadband provider. While rural mobile broadband coverage has improved, 3.8 million people in rural areas have no mobile broadband access. In addition, the U.S. population in rural areas is not covered by as many mobile broadband providers as other areas of the country. While 82 percent of the total U.S. population lives in census blocks with coverage by three or more mobile broadband providers, this is true for only 38 percent of the rural population. In addition, 68 percent of the total U.S. population lives in census blocks with coverage by four or more mobile broadband providers, while only 17 percent of the rural population is covered by four or more providers.[1128]

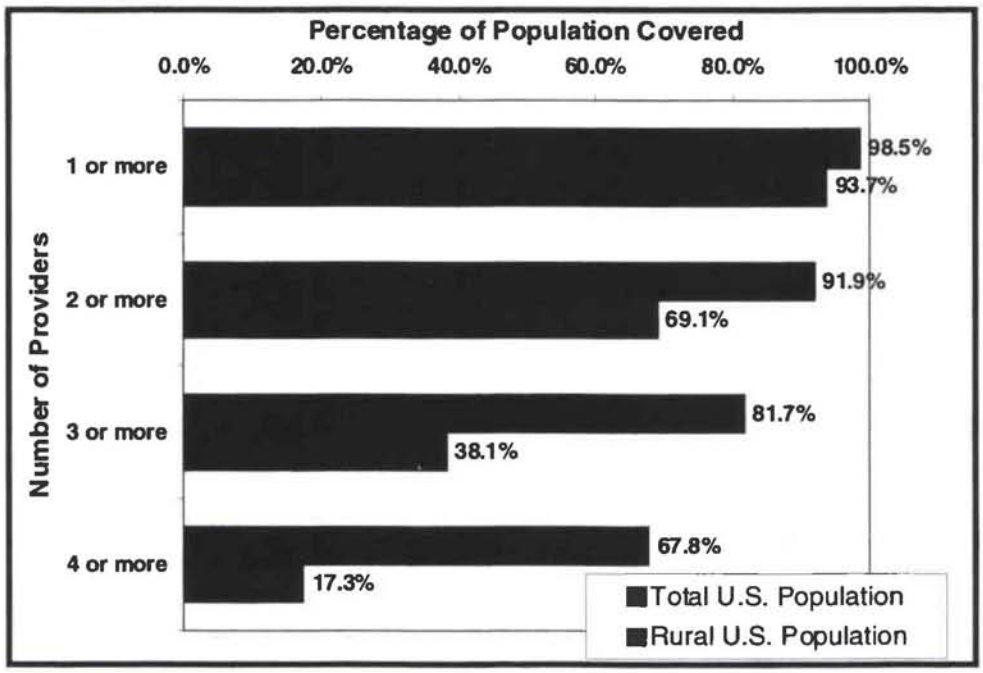
[1127] See also National Broadband Map, Broadband Statistics Report, Broadband Availability in Urban versus Rural Areas, *available at* http://www.broadbandmap.gov/download/reports/national-broadband-map-broadband-availability-in-rural-vs-urban-areas.pdf, visited Feb. 28, 2011.

[1128] *See* Section III.C.1, Number of Competitors – Coverage and Service Offerings, *supra.* For purposes of this analysis, Sprint and Clearwire are considered to be a single mobile broadband competitor. If the companies were considered as separate competitors, as in the *Fourteenth Report*, 35 percent of the total U.S. population would be covered by four or more mobile broadband providers, while 12 percent of the rural population would be covered by four or more such providers. The figures for the percentage of the total U.S. population and the rural population covered by three or more providers would be the same (when rounded) whether or not Sprint and Clearwire were considered separate mobile broadband providers.

Table 41
Estimated Mobile Broadband Coverage in Rural Areas by Census Block[1129]

Total Number of Providers with Coverage in a Block	*Number of Rural Census Blocks*	*POPs Contained in Rural Census Blocks*	*% of Total U.S. POPs*	*Square Miles Contained in Those Blocks*	*% of Total U.S. Square Miles*
Total for Rural U.S.	*4,169,790*	*60,836,650*	*21.3%*	*3,367,687*	*88.6%*
			% of Total Rural U.S. POPs		*% of Total Rural U.S. Square Miles*
1 or More	3,539,318	56,991,088	93.7	1,788,137	53.1
2 or More	2,212,589	42,024,607	69.1	855,268	25.4
3 or More	904,648	23,158,908	38.1	222,982	6.6
4 or More	295,099	10,509,664	17.3	52,305	1.6

Chart 49
Mobile Broadband Coverage in Rural Areas



382. On the basis of NRUF data, we provide a comparison of the number of wireless service providers offering service in rural and non-rural CMAs in the United States, which is shown in Table 42 below. For this purpose, we consider a CMA to be rural if the CMA has a population density less than or equal to 100 people per square mile.[1130] Under this definition, 399 CMAs are rural and 317 CMAs are

[1129] Commission estimates based on data supplied by American Roamer, Aug. 2010 (EV-DO/HSPA/WiMAX Coverage). For purposes of this analysis, Sprint and Clearwire are considered to be a single provider. POPs are from the 2000 Census, and the square miles include the United States and Puerto Rico.

[1130] The Communications Act does not include a statutory definition of what constitutes a rural area. Since its 2004 *Report and Order* concerning deployment of wireless services in rural areas, the Commission has adopted a "baseline" definition of rural as a county with a population density of 100 persons or fewer per square mile. Because of the limitations of NRUF data, as discussed above, it would be inaccurate to analyze the number of (continued....)

non-rural. As discussed above, when looking at all of the CMAs of the entire United States – both rural and non-rural – no CMA has fewer than two providers offering service in at least some portion of the CMA (see Table 8).

383. Table 42 shows that non-rural CMAs generally have more providers offering service than rural CMAs. For instance, 16 percent of rural CMAs have only two providers offering service in at least some part of the CMA, whereas all non-rural CMAs have more than two service providers. Similarly, 28 percent of rural CMAs have three providers offering service somewhere in the CMA, as compared to 8.5 percent of non-rural CMAs. Thus, consumers in 44 percent of rural CMAs have at most a choice of three facilities-based service providers, while only those consumers in 8.5 percent of non-rural CMAs are so limited. Finally, approximately 91 percent of non-rural CMAs, as opposed to close to 56 percent of rural CMAs, have four or more providers offering service somewhere in the CMA.

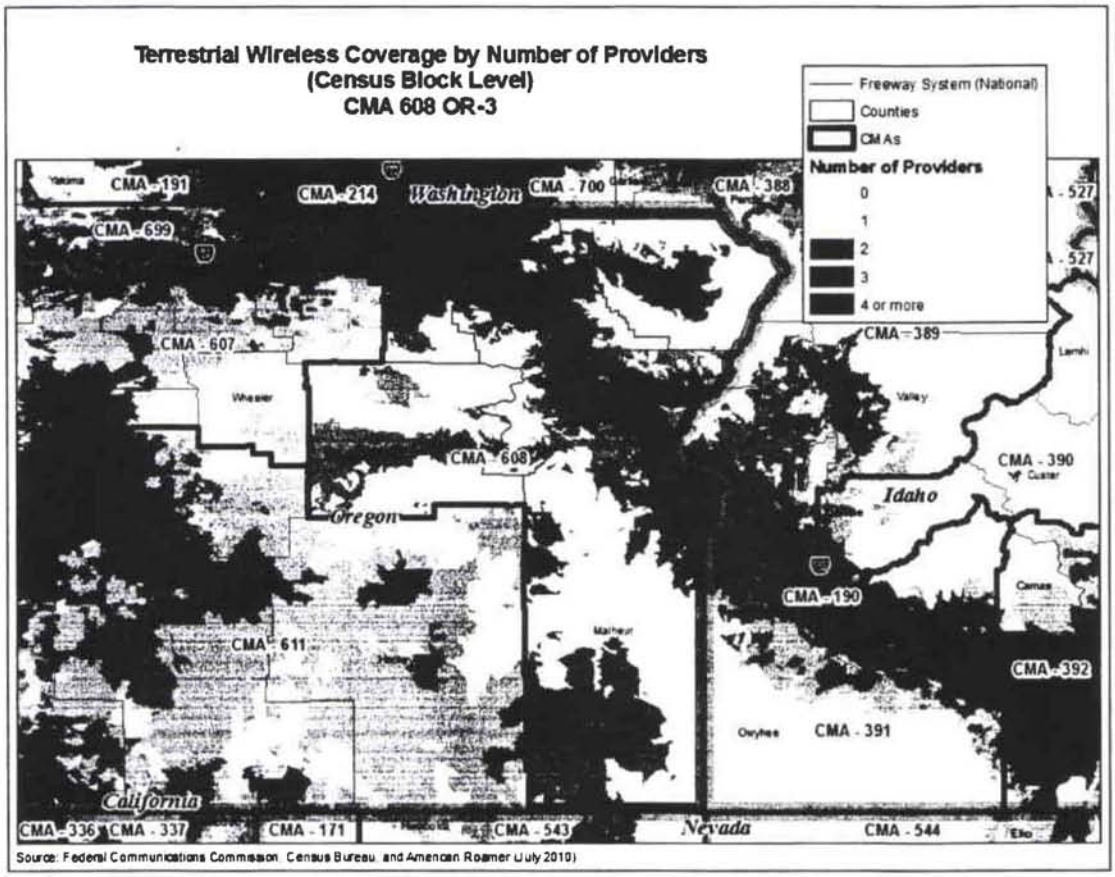
384. We also note that any given CMA is often made up of several counties, and a facilities-based service provider may offer service to consumers in only part of a CMA dependent on where that service provider has coverage. Therefore, a consumer may have fewer choices of service providers than the total number of providers offering service in his or her CMA. This is illustrated in Map 4 below, which presents coverage according to American Roamer.

Table 42
Estimated Mobile Wireless Providers Offering Service
Anywhere In Urban and Rural CMAs, Excluding Territories

	Non-Rural CMAs		*Rural CMAs*	
Number of Providers Offering Service Anywhere in a CMA	***Number of CMAs***	***Percent of Total CMAs***	***Number of CMAs***	***Percent of Total CMAs***
Total for U.S. excluding territories	*317*	*100%*	*399*	*100%*
1 provider	0	0%	0	0%
2 providers	0	0%	64	16.0%
3 providers	27	8.5%	113	28.3%
4 providers	107	33.8%	124	31.1%
5 providers	158	49.8%	92	23.1%
6 or more providers	25	7.9%	6	1.5%

(Continued from previous page)
service providers at the county level. Therefore we have analyzed the number of service providers at the CMA level and consider a CMA to be rural if it has a population density less than or equal to 100 people per square mile.

Map 4
Service Provider Coverage in an Illustrative Rural CMA



385. In the winter of 2009, the National Telecommunications Cooperative Association (NTCA) surveyed its members regarding their provision of wireless services.[1131] Population density in most NTCA member service areas is extremely rural, between one and five persons per square mile.[1132] According to the survey report, 76 percent of survey respondents are offering wireless service to their customers.[1133] Among those respondents, 84 percent indicated that "competition from national carriers" was a major concern, and the average respondent indicated that their company competes with between two to five other providers, up from one and four other providers in the 2008 report.[1134] In addition, the percentage of respondents who claim that obtaining financing is "very difficult" or "virtually impossible" was 33 percent in 2009, only slightly lower than the 34 percent reported in 2008.[1135] On the other hand,

[1131] *See* NTCA, *NTCA 2009 Wireless Survey Report*, Apr. 2010, at 3, *available at* http://www.ntca.org/images/stories/Documents/Advocacy/SurveyReports/2009ntcawirelesssurveyreport.pdf, (*2009 NTCA Wireless Survey*).

[1132] *2009 NTCA Wireless Survey*, at 5.

[1133] *2009 NTCA Wireless Survey*, at 8.

[1134] *2009 NTCA Wireless Survey*, at 13.

[1135] *2008 NTCA Wireless Survey*, at 10.

the percentage of respondents who reported that obtaining financing is "very easy" or "relatively easy" rose from 31 percent in 2008 to 43 percent in 2009.[1136]

386. When looking at the features and services offered to wireless customers, the percentage of the NTCA survey respondents that provide text messaging rose from 83 percent to 90 percent in 2009, the percentage that offer Internet access rose from 67 percent to 73 percent, and the percentage that offer email rose from 58 percent to 63 percent during the same period.[1137] On the other hand, the percentage that offer family plans, unlimited local calling, and prepaid service all declined significantly during 2009.[1138]

387. As discussed above, key inputs for the provision of mobile wireless services include spectrum, infrastructure, and backhaul, and such access to such inputs can affect entry into the mobile wireless services market in both urban and rural areas.[1139] Areas with low population density, such as rural areas, tend to have fewer facilities-based competitors than areas with higher population densities because the market may not be large enough for a potential entrant to recoup its network deployment costs over time from service revenues.[1140] In the recent State of the Union address, President Obama detailed an initiative to expand wireless coverage to 98 percent of Americans within five years. On Feb 10, 2011, the White House released a statement which detailed a one-time $5 billion investment supporting the 4G build out in rural areas.[1141]

388. Spectrum below 1 GHz can be crucial for the deployment of mobile wireless service in rural areas because its propagation characteristics allow providers to cover a relatively large geographic area with a relatively small number of cell sites.[1142] Therefore, we have examined the current spectrum holdings of service providers in rural areas across the various frequency bands (700 MHz, Cellular, PCS/AWS, and 2.5 GHz (BRS and EBS)).[1143] Table 43 below shows that from the frequency bands below 1 GHz, 51 percent of the MHz-POPs in the 700 MHz frequency band and 78 percent of the MHz-POPs in the cellular frequency band are held by the two largest service providers, Verizon Wireless and AT&T. Looking at the spectrum held above 1 GHz (PCS/AWS and 2.5 GHz), a significant percentage of the MHz-POPs above 1 GHz are held by Sprint/Clearwire. However, the remaining spectrum above 1 GHz is held by a range of different service providers, and the two largest providers combined hold no 2.5 GHz spectrum and approximately 31 percent of the MHz-POPs in the PCS/AWS frequency bands.

[1136] *2008 NTCA Wireless Survey*, at 10.

[1137] *2009 NTCA Wireless Survey*, at 14.

[1138] *2009 NTCA Wireless Survey*, at 14.

[1139] *See* Section III.D.2, Non-Regulatory Entry and Exit Conditions, *supra.*

[1140] *See Id.*

[1141] *See* "President Obama Details Plan to Win the Future through Expanded Wireless Access", available at http://www.whitehouse.gov/the-press-office/2011/02/10/president-obama-details-plan-win-future-through-expanded-wireless-access, visited Feb. 10, 2011.

[1142] *See* Section VII.A.1, Spectrum, *supra.*

[1143] As discussed above, a "rural area" is defined, for purposes of this *Report*, as a county with a population density of 100 persons or fewer per square mile.

Table 43
Percentage Spectrum Holdings in Rural Areas on a MHz-POPs Basis by Provider and Frequency Band[1144]

Licensee	700 MHz	Cellular (850 MHz)	PCS/AWS (1.9 GHz; 1.7/2.1 GHz)	2.5 GHz (BRS and EBS)
Verizon Wireless	38.2%	43.6%	13.1%	0.0%
AT&T	13.4%	34.8%	17.5%	0.0%
Sprint Nextel/Clearwire	0.0%	0.0%	16.0%	100.0%
T-Mobile	0.0%	0.1%	19.5%	0.0%
MetroPCS	0.1%	0.0%	3.9%	0.0%
US Cellular	6.4%	10.1%	2.5%	0.0%
Leap	0.0%	0.0%	5.3%	0.0%
Other	42.0%	11.5%	22.3%	0.0%
Grand Total	100.0%	100.0%	100.0%	100.0%

X. INTERNATIONAL COMPARISONS

389. This section compares mobile market structure and performance in the United States, Western Europe, and Asia-Pacific countries of comparable income levels.[1145] To ensure that a consistent methodology is used to compile the data for different countries, the comparison is based on international cross-section data compiled by Bank of America Merrill Lynch.[1146] Consequently, the estimates of mobile penetration, minutes of use (MOUs), average revenue per minute (RPM), and concentration (as measured by HHI) for the U.S. mobile market cited in this section differ somewhat from estimates provided in previous sections of the *Report* because they come from different sources. In general, the comparison shows the following: (1) market structure is converging to three or four national competitors per market in many countries; (2) the calling party pays system used in most other countries tends to result in lower average voice usage (MOUs) and higher revenue per minute of voice service than the receiving party pays system used in the United States;[1147] (3) the average monthly subscriber bill in the United States is much higher than the average bill in Western Europe, although Japan has a higher average monthly bill than either the United States or Western Europe; and (4) international differences in regulatory policy and business environment have produced a wide variety of successful models for the mobile sector, with no one model dominating on all dimensions of market performance.

[1144] Commission estimates.

[1145] In accordance with established practice in using international benchmarking to assess effective competition in mobile markets, the comparison of mobile market performance is restricted to Western Europe and parts of the Asia-Pacific in order to ensure that the countries being compared are roughly similar to the United States with regard to their level of economic and telecommunications infrastructure development. *See, for example*, UK regulator Oftel's review of effective competition in the mobile market: *Effective Competition Review: Mobile*, Office of Telecommunications, Feb. 2001, at 7.

[1146] *See* Glen Campbell *et al.*, *Global Wireless Matrix 4Q09*, Bank of America Merrill Lynch, Global Equity Research, Apr. 13, 2010 (*Global Wireless Matrix 4Q09*). The Merrill Lynch HHI calculations are used in this Report only for the purposes of the international comparison. The HHI calculation for the United States in Section III.C.2, Herfindahl-Hirschman Index , *supra*, differs from the Merrill Lynch estimate discussed in Section X.E, Concentration, *infra*.

[1147] *See Thirteenth Report*, 24 FCC Rcd at 6290, ¶ 223.

Table 44
Mobile Market Performance in Selected Countries[1148]

Country	Penetration (% of Pops)	Prepaid (% of Subs)	MOUs	RPM ($) Voice Only	ARPU ($)	Data (% of ARPU)
Receiving Party Pays						
USA	93	19	824	0.04	49.91	29.3
Canada	68	20	426	0.09	55.14	22.1
Singapore	144	50	380	0.06	33.01	31.0
Calling Party Pays						
UK	129	59	194	0.11	33.52	33
Germany	132	56	109	0.16	22.08	29.8
Italy	147	87	141	0.15	29.12	26.1
Sweden	131	35	211	0.10	31.11	25.3
France	96	33	237	0.15	48.40	23.7
Finland	144	13	218	0.13	33.52	20.5
Japan	88	1	137	0.25	58.06	44.5
South Korea	99	3	311	0.09	33.63	19.1
Australia	115	42	222	0.14	47.27	36.1

A. ARPU

390. The average monthly subscriber bill (ARPU) in the United States, at $49.91, is much higher than the Western European average of $35.09.[1149] As explained below, however, although U.S. subscribers on average spend more per month for mobile services than their European counterparts, they also consume more mobile services, on average, compared to Europe. We note that Canada and Japan have a higher ARPU than either the United States or Western Europe. As indicated below and in Table 44 above, the relatively high average monthly subscriber bill in Japan reflects two key factors – a relatively high price per minute of voice service and relatively higher monthly spending per subscriber on data services.

B. Average RPM (Voice Only)

391. As noted above, some analysts regard RPM as a good proxy for mobile pricing.[1150] RPM (voice only) in Western Europe averaged about $0.16 in the fourth quarter of 2009, and ranged from a

[1148] *Global Wireless Matrix 4Q09.*

[1149] *Global Wireless Matrix 4Q09*, at 2.

[1150] *See* Section V.D.1, Price Indicators, *supra*. Average RPM is calculated by dividing monthly voice-only ARPU by MOUs. Service revenues included in ARPU reflect the fees mobile operators collect from other network operators for terminating incoming calls on their networks as well as monthly service charges and usage fees paid by mobile subscribers. Merrill Lynch has noted that these data have certain limitations for comparing countries that use calling party pays (CPP) versus mobile party pays (also known as receiving party pays). The figures for MOUs may be somewhat understated, and the revenue figures used to calculate ARPM may be somewhat overstated, in markets where CPP is used relative to non-CPP markets. MOUs figures may be somewhat understated in CPP markets due to the double-counting of same-network ("on-net") mobile-to-mobile minutes in non-CPP markets such as the U.S., i.e. each minute of an on-net call is billed to both the caller and the receiver under the mobile party pays system, whereas under CPP each on-net minute is billed only to the calling party, and therefore counted only once. *See Tenth Report*, 20 FCC Rcd at 15976, n.457. In addition, the revenue figures used to calculate ARPU may be somewhat overstated in CPP markets relative to non-CPP markets (due to double-counting of mobile termination revenues for off-net mobile-to-mobile calls in CPP markets). Consequently, the RPM figures (ARPU divided by MOUs) probably overstate the difference between RPM in the United States and CPP markets. The potential for service revenues to be somewhat overstated in CPP markets was brought to the Commission's attention by Professor Stephen Littlechild, and confirmed by Merrill Lynch through e-mail correspondence.

low of $0.10 in Sweden to a high of $0.31 in Switzerland.[1151] This compares with an estimated U.S. RPM of $0.04, a quarter of the European average.[1152] Revenue per minute in Japan, at $0.25, was more than six times the U.S. figure at the end of 2009.[1153]

C. Usage

392. Bank of America Merrill Lynch estimates that U.S. mobile subscribers talked an average of 824 minutes per month on their mobile phones in the fourth quarter of 2009.[1154] This compares with 137 MOUs in Japan and an average across Western Europe of 160 MOUs, with estimated MOUs in individual European countries ranging from a low of 109 in Germany to a high of 251 in Norway.[1155]

D. Penetration Rates

393. According to Bank of America Merrill Lynch, mobile penetration in the United States rose to 93 percent in the fourth quarter of 2009.[1156] In comparison, Japan finished 2009 with mobile penetration at 88 percent, while mobile penetration averaged an estimated 131 percent in Western Europe at the end of 2009 and ranged from 96 percent in France to nearly 224 percent in Greece.[1157] Estimated mobile penetration continued to exceed 100 percent in most of Western Europe at the end of 2009, due in part to a high percentage of prepaid subscribers and ownership of multiple devices or subscriber identity module (SIM) cards.[1158]

E. Concentration

394. The Bank of America Merrill Lynch's *Global Wireless Matrix* provides a cross-country comparison of industry concentration using HHIs calculated at national level.[1159] This methodology can produce misleading measures of concentration in industries such as mobile wireless services, where the

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[1151] *Global Wireless Matrix 4Q09*, at 2.

[1152] *Global Wireless Matrix 4Q09*, at 2. In e-mail correspondence, Merrill Lynch has indicated that RPM figures may overstate the difference between RPM in CPP and non-CPP markets by about 15 percent due to the two factors mentioned above.

[1153] *Global Wireless Matrix 4Q09*, at 2.

[1154] *Global Wireless Matrix 4Q09*, at 2. This is higher than the 696 average monthly MOUs estimated by CTIA for the second half of 2009. *See* Section V.C.1, Mobile Voice, *supra*. For purposes of comparing metrics in different countries, average MOUs include both incoming and outgoing minutes, and usually exclude traffic related to mobile data services.

[1155] *Global Wireless Matrix 4Q09*, at 2.

[1156] *Global Wireless Matrix 4Q09*, at 2.

[1157] *Global Wireless Matrix 4Q09*, at 2.

[1158] *Global Wireless Matrix 4Q09*, at 2. Reported mobile subscriber figures and penetration may be overstated in some countries, particularly those with a high percentage of prepaid subscribers, due in part to a combination of factors: (1) slow clearing out of inactive users (for example, subscribers who have switched service providers) from their former provider's subscriber base; (2) multiple device ownership (for example, users of a Blackberry plus a mobile phone); and (3) multiple SIM card ownership (for example, users who switch between operators in order to take advantage of different tariffs at different times of the day or week). *See* Jeff Kvaal *et al.*, *Wireless Equipment Industry Update: Strong Net Adds Drive Higher Phone Units*, Lehman Brothers, Equity Research, Jan. 16, 2007, at 4. As noted in previous reports, carriers have widely different policies to determine when to cut off inactive subscribers and to remove them from their reported subscriber base. In addition, it is becoming more prevalent for people to subscribe to multiple mobile service providers. *See, e.g., Eleventh Report,* 21 FCC Rcd at 11021, ¶ 190 n.506; *Tenth Report*, 20 FCC Rcd at 15976, n.452; *Seventh Report*, 17 FCC Rcd at 13033, and *Sixth Report*, 16 FCC Rcd at 13391.

[1159] *See Global Wireless Matrix 4Q09*, at 2.

relevant geographic market is local rather than nationwide, and where the choice of competing providers is not relatively uniform throughout the country. The U.S. mobile wireless services market, for instance, is characterized by significant regional variation in the choice of competing providers. Moreover, the methodology used by Bank of America Merrill Lynch to calculate the U.S. national market HHI is different from the one implemented earlier in this *Report*.[1160]

395. As shown in Table 45 below, the Bank of America Merrill Lynch study indicates that the United Kingdom had the least concentrated mobile market at the end of 2009, with an estimated HHI of 2220.[1161] The U.S. mobile market had the next lowest concentration level at an HHI of 2350. Among countries of comparable income levels in Western Europe and the Asia Pacific region, those with the highest levels of mobile market concentration at the end of 2009 were Switzerland, where the HHI was 4580, and New Zealand, at 4620.[1162] As discussed above, we estimated an average HHI for the United States of 2811 at the end of 2009, based on EA subscriber market shares.[1163] If this HHI estimate were substituted for the Bank of America Merrill Lynch estimate, the United States would still rank second lowest in concentration among the countries surveyed.

Table 45
Mobile Market Structure in Selected Countries (Merrill Lynch Calculation)[1164]

Country	Nationwide HHI	Number of Competitors[1165]	Top 2 Share (%)
UK	2220	5	50.6%
USA	2350	5	61.2%
Germany	2840	4	68.2%
Italy	2910	4	68.8%
Canada	3090	3	67.1%
Sweden	3320	4	75.4%
France	3340	3	77.2%
Australia	3450	3	76.9%

[1160] *See* Section III.C, Horizontal Concentration, *supra*. For the U.S., the Bank of America Merrill Lynch study calculates the HHI at the national level by summing the squares of the subscriber market shares of the four nationwide operators and the residual subscriber market share of all remaining regional and local operators combined. This methodology essentially treats all regional and local operators as if they comprised a single fifth competing nationwide operator. Since a certain percentage of the U.S. population lives in areas with more than five competing operators and a certain percentage lives in areas with less than five, the Merrill Lynch estimate of HHI at the national level overstates concentration in some local geographic markets, while understating concentration in others.

[1161] *See Global Wireless Matrix 4Q09*, at 2.

[1162] *See Global Wireless Matrix 4Q09*, at 2.

[1163] *See* Section III.C, Horizontal Concentration, *supra*.

[1164] *Global Wireless Matrix 4Q09*. As noted above, HHI is calculated based on national market share. The weighted average HHI in the U.S. was 2811 at the end of 2009 as described in Section III.C, Horizontal Concentration, *supra*.

[1165] While there are four nationwide mobile providers in the United States, the HHI for the United States, as described above, is calculated by summing the squares of the subscriber market shares of the four nationwide operators and the residual subscriber market share of all remaining regional and local operators combined, treating all regional and local operators as if they comprised a single fifth competing operator. For countries other than the United States, the HHI generally is calculated by summing the squares of all of the mobile operators, regardless of whether the operator's network covers a nationwide footprint. If this same methodology were used for the United States, our expectation is that the U.S. HHI would be lower, given the large number of regional and local mobile operators in the United States with sub-national footprints.

Finland	3460	3	76.0%
Japan	3570	4	76.9%

XI. CONCLUSION

396. Promoting competition is a fundamental goal of the Commission's policymaking. Competition has played and must continue to play an essential role in the mobile wireless industry – leading to lower prices and higher quality for American consumers, and producing new waves of innovation and investment in wireless networks, devices, and services. This *Report* analyzes competition in the mobile wireless industry pursuant to section 332(c)(1)(C) of the Communications Act and highlights several key trends in the industry. As with past reports, this *Report* examines the structure of the mobile wireless industry, the conduct of service providers, industry performance metrics, and consumer responses to mobile wireless service offerings. Like the *Fourteenth Report*, it also analyzes competition throughout the entire mobile wireless ecosystem, including key mobile wireless service inputs – such as spectrum and backhaul facilities – as well as downstream products, such as handsets/devices and mobile applications.

397. As discussed in the various sections of the *Report* above, there has continued to be a marked shift from voice to data within the industry, as consumers have dramatically increased their use of mobile data services and applications, and their adoption of data-centric devices. With this transformation to data, promoting and ensuring an active competitive marketplace must remain a key imperative for the Commission. The increased demand for mobile data is contributing to the spectrum crunch, and a gap between mobile broadband network deployment in rural and urban areas persists. In addition, the *Report* highlights the increasing importance of industry data on mobile broadband services to the Commission's analysis of mobile wireless competition.

XII. PROCEDURAL MATTERS

398. This *Fifteenth Report* is issued pursuant to authority contained in Section 332(c)(1)(C) of the Communications Act of 1934, as amended, 47 U.S.C. § 332(c)(1)(C).

399. It is ORDERED that copies of this *Report* be sent to the appropriate committees and subcommittees of the United States House of Representatives and the United States Senate.

400. It is FURTHER ORDERED that the proceeding in the WT Docket No. 10-133 IS TERMINATED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Spectrum Bands Available for Mobile Wireless Service

1. Currently, mobile wireless service providers primarily use spectrum licenses to provide mobile voice data services. These licenses are assigned using a competitive bidding process and configured for a range of predefined spectrum blocks (*e.g.*, 10 megahertz, 20 megahertz or some other amount) over a defined geographic area (*e.g.*, a Major Economic Area as outlined in section 27.6 of the Rules). Initially, the Commission authorized up to eight different mobile wireless licenses (two cellular in the 800 MHz band and six broadband PCS in the 2 GHz band) in every geographical area of the country.[1] However, over the years, additional services have been created that allow similar operations in different bands – including 700 MHz, AWS-1, BRS/EBS, WCS, and 1670-1675 MHz – that are licensed under the Commission's flexible Part 90, Part 27 or Part 24 rules and can be used to provide mobile wireless services.[2] Under Commission rules, licensees may lease spectrum resources to a third party for a period of time; or may disaggregate (divide the spectrum into smaller amounts of bandwidth) and/or partition (divide the license into smaller geographical areas) their licenses to other entities.[3] Many licensees hold more than one license in a particular market.[4] We discuss in more detail below spectrum bands potentially available for terrestrial CMRS. Band plan diagrams for each spectrum band depict where the frequencies are located. Spectrum described in this section may be used for a variety of mobile wireless services including voice, broadband data and video services. In addition to the terrestrial spectrum described in this section, there is an additional 157.7 megahertz of mobile satellite spectrum available for mobile voice and data services.

A. Cellular

2. The Commission began licensing commercial cellular providers in 1982 and completed licensing the majority of operators by 1991. The Commission divided the United States and its possessions into 734 cellular market areas (CMAs), including 305 Metropolitan Statistical Areas (MSAs), 428 Rural Service Areas (RSAs), and a market for the Gulf of Mexico.[5] Two cellular systems were

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[1] As a result of partitioning and disaggregation, there often are more than eight cellular and broadband PCS licenses in a market. However, in a few areas, there may be fewer than eight active licenses because certain auction winners or licensees have defaulted on payments to the Commission, because some licensees did not meet their buildout requirements, some licensees returned their licenses, or some licenses remained unsold in an auction.

[2] The discussion in this *Report* is to be distinguished from the identification of the relevant spectrum input markets in the context of Commission review of individual wireless license transfers and assignments. For example, in wireless transactions, the Commission includes, in its evaluation of potential competitive harm, spectrum in particular bands that is "suitable" for the provision of services in a relevant product market. *See* Applications of AT&T Inc. and Dobson Communications Corporation, *Memorandum Opinion and Sprint Nextel/Clearwire Order*, FCC 07-19608-259, at 17 ¶ 26 (rel. Nov. 19, 2007) ¶ 53; *Verizon Wireless/Alltel Order*, FCC 08-258, at ¶ 53 ("[S]uitability is determined by whether the spectrum is capable of supporting mobile service given its physical properties and the state of equipment technology, whether the spectrum is licensed with a mobile allocation and corresponding service rules, and whether the spectrum is committed to another use that effectively precludes its uses for mobile telephony/broadband service.")

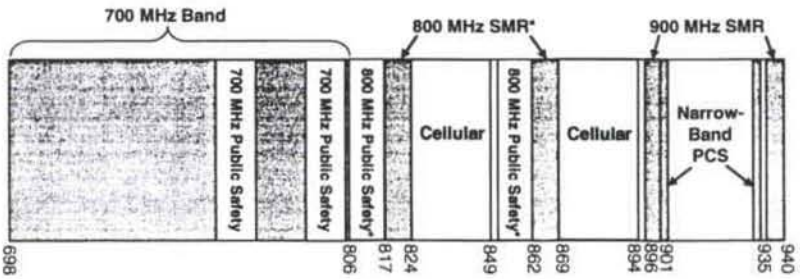
[3] *See* 47 C.F.R. §§ 1.948(e), (f), 22.948, 24.104, 27.15, 24.714, 27.904, 90.813, 90.911.

[4] While no longer in operation, at one time the Commission's CMRS spectrum cap restricted the distribution of certain spectrum licenses. Recently, licensees have requested that the Commission take measures to restrict the ability of current major 700 MHz license holders to acquire additional 700 MHz spectrum rights.

[5] Under the original cellular licensing rules, one of the two cellular channel blocks in each market (the B block) was awarded to a local wireline carrier, while the other block (the A block) was awarded competitively to a carrier other than a local wireline incumbent. After awarding the first 30 MSA licenses pursuant to comparative hearing rules, the Commission adopted rules in 1984 and 1986 to award the remaining cellular MSA and RSA licenses through (continued....)

licensed in each market area. The Commission designated 50 megahertz of spectrum in the 800 MHz frequency band for the two competing cellular systems in each market (25 megahertz for each system). Initially, cellular systems offered service using analog technology, but today cellular systems use digital modulation technologies for increased capacity and service options.

698-940 MHz: Cellular Spectrum



B. Broadband PCS

3. The Broadband PCS was established in the mid-1990s to expand spectrum options and the competitive marketplace for mobile services beyond the Cellular service. Broadband PCS systems operate in different spectrum bands and have been designed from the beginning to use a digital format. Broadband PCS licenses have been assigned through auction, beginning in 1995.[6] The Commission has set aside spectrum between 1850 MHz and 1990 MHz for Broadband PCS. While this spectrum (120 megahertz total) originally accommodated voice and limited messaging services, many licensees have evolved their networks to now provide mobile broadband services, which include applications such as Internet access and media applications.

4. This spectrum was divided originally into three blocks of 30 megahertz each (blocks A, B, and C) and three blocks of 10 megahertz each (blocks D, E, and F).[7] Two of the 30 megahertz blocks

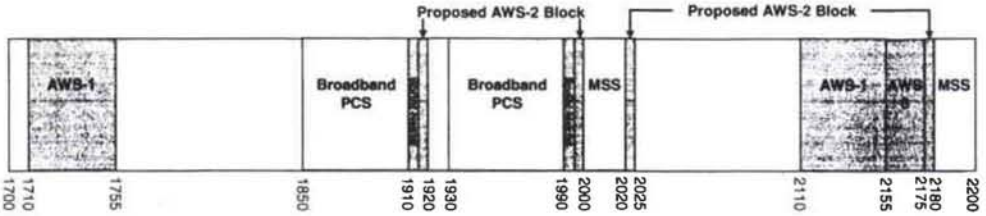
(Continued from previous page)
lotteries. By 1991, lotteries had been held for every MSA and RSA, and licenses were awarded to the lottery winners in most instances. In some RSA markets, however, the initial lottery winner was disqualified from receiving the license because of a successful petition to deny or other Commission action. Implementation of Competitive Bidding Rules to License Certain Rural Service Areas, *Report and Order*, 17 FCC Rcd 1960, 1961-62 (2002). In 1997, the Commission auctioned cellular spectrum in areas unbuilt by the original cellular licensees. *See* FCC, *Auction 12: Cellular Unserved*, http://wireless.fcc.gov/auctions/12 (visited Mar. 16, 2010). In 2002, the Commission auctioned three RSA licenses where the initial lottery winner had been disqualified. *See* FCC, *Auction 45: Cellular RSA*, http://wireless.fcc.gov/auctions/45 (visited Mar. 16, 2010). In 2008, the Commission held a closed auction for unserved cellular spectrum that was the subject of two groups of pending mutually exclusive long-form applications. *See* FCC, *Auction 77: Closed Cellular Unserved*, http://wireless.fcc.gov/auctions/477 (visited Mar. 16, 2010).

[6] The first auction was for two license blocks of 30 megahertz each in 51 Major Trading Areas (MTAs). FCC Grants 99 Licenses for Broadband Personal Communications Services in Major Trading Areas, *News Release*, FCC, June 23, 1995. However, in New York, Washington/Baltimore, and Los Angeles/San Diego, only one license block was auctioned, because one license in each market was awarded as part of a pioneer preference program in 1994. Three Pioneer Preference PCS Applications Granted, *News Release*, FCC, Dec. 14, 1994. The Commission has since had numerous additional broadband PCS auctions. *See* FCC, *Auctions Home*, http://wireless.fcc.gov/auctions/ (visited Mar. 16, 2010).

[7] Initially, the Commission's broadband PCS allocation included 20 megahertz of spectrum at 1910 MHz - 1930 MHz for unlicensed broadband PCS. Ten megahertz has since been allocated on a nationwide basis to Sprint Nextel. *See* Improving Public Safety Communications in the 800 MHz Band, *Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order*, 19 FCC Rcd 14969, 15083 (2004).

(A and B blocks) are assigned on the basis of 51 Major Trading Areas (MTAs).[8] One of the 30 megahertz blocks (C block)[9] and all three of the 10 megahertz blocks are assigned on the basis of 493 Basic Trading Areas (BTAs).[10]

1700-2200 MHz: Broadband PCS Spectrum



C. SMR

5. The Commission first established SMR in 1979 to provide for land mobile communications on a commercial basis. The Commission initially licensed spectrum in the 800 and 900 MHz bands for this service, in non-contiguous bands, on a site-by-site basis.[11] The Commission has since licensed additional SMR spectrum through auctions.[12] In total, the Commission has licensed 19 megahertz of SMR spectrum, plus an additional 7.5 megahertz of spectrum that is available for SMR as well as other services.[13] While Commission policy permits flexible use of this spectrum, including the

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[8] Major Trading Areas are Material Copyright (c) 1992 Rand McNally & Company. Rights granted pursuant to a license from Rand McNally & Company through an arrangement with the FCC. Rand McNally's MTA specification contains 47 geographic areas covering the 50 states and the District of Columbia. For its spectrum auctions, the Commission has added three MTA-like areas: Guam and the Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands, and American Samoa. In addition, Alaska was separated from the Seattle MTA into its own MTA-like area. MTAs are combinations of two or more Basic Trading Areas.

[9] The Commission also has reconfigured returned C block licenses. *See Tenth Report*, 20 FCC Rcd at 15935, ¶ 71, n.150.

[10] Basic Trading Areas (BTAs) are Material Copyright (c) 1992 Rand McNally & Company. Rights granted pursuant to a license from Rand McNally & Company through an agreement with the FCC. BTAs are geographic areas drawn based on the counties in which residents of a given BTA make the bulk of their shopping goods purchases. Rand McNally's BTA specification contains 487 geographic areas covering the 50 states and the District of Columbia. For its spectrum auctions, the Commission added additional BTA-like areas for: American Samoa; Guam; Northern Mariana Islands; San Juan, Puerto Rico; Mayagüez/Aguadilla-Ponce, Puerto Rico; and the U.S. Virgin Islands.

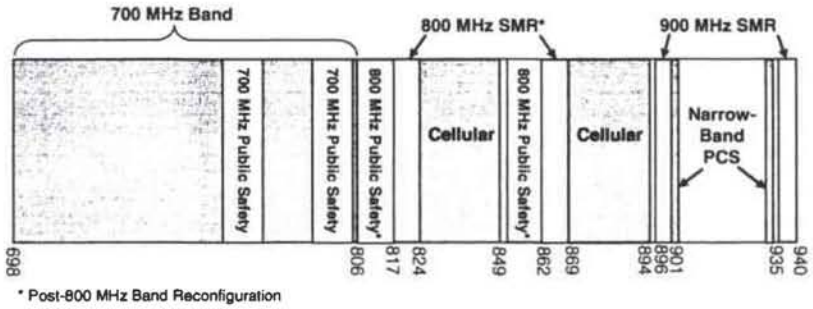
[11] The "900 MHz" SMR band refers to spectrum allocated in the 896-901 and 935-940 MHz bands; the "800 MHz" band refers to spectrum allocated in the 806-824 and 851-869 MHz bands. *See* 47 C.F.R. § 90.603; *see also* 47 C.F.R. § 90.7 (defining "specialized mobile radio system").

[12] The Commission has held multiple auctions for SMR licenses. *See* FCC, *Auctions Home*, http://wireless.fcc.gov/auctions/ (visited Mar. 16, 2010).

[13] There are five megahertz in the 900 MHz band (200 paired channels x 12.5 kHz/channel). *See* 47 C.F.R. § 90.617, Table 4B. There are 21.5 megahertz in the 800 MHz band: 14 megahertz in the 800 SMR Service (280 paired channels x 25 kHz/channel) and 7.5 megahertz in the 800 MHz General Category (150 paired channels x 25 kHz/channel). *See* 47 C.F.R. § 90.615, Table 1 (SMR General Category) and 47 C.F.R. § 90.617, Table 4A (SMR Service). In 2000, the Commission amended its rules to allow Business and Industrial/Land Transportation licensees in the 800 MHz band to use their spectrum for CMRS operations under certain conditions. Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies; Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz; Petition for Rule Making of The American Mobile Telecommunications Association, *Report and Order and Further Notice of Proposed Rule Making*, 15 FCC Rcd 22709, 22760-61 (2000). This could make up to five megahertz of additional spectrum available for digital SMR providers: 2.5 megahertz in the Industrial/Land Transportation Category (50 paired channels x 25 kHz/channel) and 2.5 megahertz in the (continued....)

provision of paging, dispatch, mobile voice, mobile data, facsimile, or combinations of these services,[14] the primary use for SMR traditionally was dispatch services.[15] With the development of digital technologies that increased spectral efficiency, SMR providers such as Sprint Nextel (on its iDEN network) and SouthernLINC Wireless, a unit of the energy firm Southern Company, became more significant competitors in mobile telephony, while also maintaining dispatch functionality as a part of their service offerings. Furthermore, in apparent response to the dispatch functionality of SMR services, many cellular and broadband PCS providers now offer push-to-talk (PTT) functionality on their networks, including Verizon Wireless and AT&T. SMR spectrum is also used for certain data-only networks.

698-940 MHz: SMR Spectrum



1. 800 MHz Band Reconfiguration and 1.9 GHz Spectrum Exchange

6. On July 8, 2004, the Commission adopted a new band plan for the 800 MHz band to resolve the problem of interference to public safety radio systems operating in the band from CMRS providers operating systems on channels in close proximity to those utilized by public safety entities.[16] The new band plan addresses the root cause of the interference problem by separating generally incompatible technologies, with the costs of relocating 800 MHz incumbents to be paid by Sprint Nextel. To accomplish the reconfiguration, the Commission required Sprint Nextel to give up rights to certain of its licenses in the 800 MHz band and all of its licenses in the 700 MHz band. In exchange, the Commission modified Sprint Nextel's licenses to provide the right to operate on two five-megahertz blocks in the 1.9 GHz band – specifically 1910-1915 MHz and 1990-1995 MHz – conditioned on Sprint Nextel fulfilling certain obligations specified in the Commission's decision. As a new entrant in the 1.9 GHz band, Sprint Nextel is also obligated to fund the transition of incumbent users to comparable facilities. The Commission determined that the overall value of the 1.9 GHz spectrum is $4.8 billion, less the cost of relocating incumbent users. In addition, the Commission decided to credit to Sprint Nextel the value of the spectrum rights that Sprint Nextel is relinquishing and the actual costs Sprint Nextel incurs to

(Continued from previous page)
Business Category (50 paired channels x 25 kHz/channel). *See* 47 C.F.R. § 90.617, Tables 2A and 3A. As discussed in Section I.A.1, 800 MHz Band Reconfiguration and 1.9 GHz Spectrum Exchange, *infra*, the configuration of the 800 MHz band is changing as a result of a new band plan adopted by the Commission.

[14] Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium, *Policy Statement*, 14 FCC Rcd 19868 (1999); *see also* Applications of Various Subsidiaries and Affiliates of Geotek Communications, Inc., Debtor-In-Possession, Assignors, and Wilmington Trust Company or Hughes Electric Corporation, Assignees, For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses, *Memorandum Opinion and Order*, 15 FCC Rcd 790, 802 (2000).

[15] Dispatch services allow two-way, real-time, voice communications between fixed units and mobile units (*e.g.*, between a taxicab dispatch office and a taxi) or between two or more mobile units (*e.g.*, between a car and a truck). *See Fifth Report*, 15 FCC Rcd at 17727-28, for a detailed discussion. Dispatch and SMR are often used interchangeably, although SMR refers to specific spectrum ranges.

[16] FCC Adopts Solution to Interference Problem Faced by 800 MHz Public Safety Radio Systems, *News Release*, FCC, July 8, 2004.

relocate all incumbents in the 800 MHz and 1.9 GHz bands. To the extent that the total of these combined credits is less than the assessed value of the 1.9 GHz spectrum rights, Sprint Nextel will make an anti-windfall payment equal to the difference to the United States Department of the Treasury at the conclusion of the relocation process.

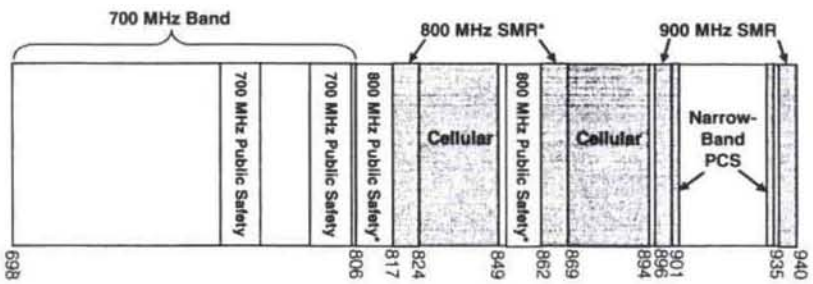
7. Significant progress has been made reconfiguring licensees to the new 800 MHz band plan in non-border regions of the country. In March 2010, the Public Safety and Homeland Security Bureau released an Order addressing supplemental waiver requests pursuant to a June 2009 Order that addressed requests for further extension, beyond July 1, 2009, of the June 26, 2008 deadline to complete 800 MHz rebanding.[17] Furthermore, the Commission, in conjunction with the State Department, is continuing to discuss a modified 800 MHz band plan with Mexico for U.S. licensees operating along the U.S.-Mexico border.[18]

D. 700 MHz Band

8. The 698-806 MHz band (the "700 MHz band") was reclaimed from use by broadcast services in connection with the transition of the analog television service to digital television (DTV).[19] The Digital Television Transition and Public Safety Act of 2005 (DTV Act)[20] set a deadline of February 17, 2009 for the 700 MHz band spectrum to be cleared of analog transmissions and made available for public safety and commercial services as part of the DTV transition. This deadline subsequently was extended to June 12, 2009.[21] This spectrum is being made available for wireless services, including public safety and commercial services.[22]

9. The DTV Act also established two specific statutory deadlines for the auction of licenses for recovered spectrum in the 700 MHz band: (1) the auction was required to begin no later than January 28, 2008; and (2) the auction proceeds were required to be deposited in the Digital Television Transition and Public Safety Fund by June 30, 2008.[23] The Commission met both of these statutory deadlines.

698-940 MHz: 700 MHz Band Spectrum



[17] *See* Improving Public Safety Communications in the 800 MHz Band; Supplemental Requests for Waiver of June 26, 2008 Rebanding Deadline, WT Docket No. 02-55, *Order*, 25 FCC Rcd 3246 (2010).

[18] *See* "Public Safety and Homeland Security Bureau Extends 800 MHz Rebanding Negotiation Period for Wave 4 Border Area NPSPAC and Non-NPSPAC Licensees Along the U.S.-Mexico Border," *Public Notice*, WT Docket No. 02-55, 25 FCC Rcd 3244 (2010)

[19] *See 700 MHz Second R&O*, 22 FCC Rcd at 15291, ¶ 1.

[20] Deficit Reduction Act of 2005, Pub. L. No. 109-171, 120 Stat. 4 (2006) (DRA). Title III of the DRA is the DTV Act.

[21] DTV Delay Act, S. 328, 111th Cong. (2009), amending 47 U.S.C. §§ 309, 337(3)(1) (DTV Delay Act).

[22] *See 700 MHz Second R&O*, 22 FCC Rcd at 15291, ¶ 1 & 15295-96, ¶ 14.

[23] *See* DRA. The DTV Act extended the Commission's auction authority to September 30, 2011, and the DTV Delay Act extended the authority to September 30, 2010. DTV Act § 3003(b).; DTV Delay Act § 5.

10. Prior to holding the auction, the Commission revisited the rules governing the 700 MHz band in light of the DTV Act, recent developments in the market for commercial wireless communications, and the evolving needs of the public safety community for advanced broadband communications.[24] Specifically, in the *700 MHz Second Report and Order*, the Commission adopted a new band plan and revised certain of the service rules relating to both the commercial and public safety spectrum in the 700 MHz band.[25] The new band plan provided a balanced mix of geographic service area licenses and spectrum blocks sizes for the commercial spectrum to be auctioned.[26] Among other service rules, the Commission provided that licensees for one of the commercial blocks of spectrum in the 700 MHz band, the Upper 700 MHz C Block would be subject to an "Open Platform" condition.[27] Accordingly, licensees must "allow customers, device manufacturers, third-party application developers, and others to use or develop the devices and applications of their choosing in C Block networks, so long as they meet all applicable regulatory requirements and comply with reasonable conditions related to management of the wireless network (*i.e.*, do not cause harm to the network)."[28] In addition, C Block licensees "may not block, degrade, or interfere with the ability of end users to download and utilize applications of their choosing on the licensee's C Block network, subject to reasonable network management."[29] The Commission also took two steps to promote the rapid construction and deployment of a nationwide, interoperable broadband public safety network. First, in the public safety spectrum, the band plan established a spectrum block designated for broadband communications, the public safety broadband spectrum, and provided that the spectrum would be licensed on a nationwide basis to a non-profit entity (the Public Safety Broadband Licensee) representative of the public safety community in accordance with a specific selection process.[30] Second, the Commission established a block in the commercial spectrum, the Upper 700 MHz D Block (D Block), to be licensed on a nationwide basis to a single entity, and required the winning bidder for the D Block to enter into a public/private partnership with the Public Safety Broadband Licensee to enable the construction of a nationwide network operating over the spectrum associated with both licenses and providing broadband services to both commercial and public safety users.[31]

11. The auction of the 700 MHz Band licenses, designated Auction 73, closed on March 18,

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[24] *See* Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; and Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones, *Notice of Proposed Rule Making, Fourth Further Notice of Proposed Rule Making, and Second Further Notice of Proposed Rule Making*, 21 FCC Rcd 9345 (2006).

[25] *See 700 MHz Second R&O*, 22 FCC Rcd at 15291-95, ¶¶ 1-13; Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd 8064 (2007) (*700 MHz Report and Order*).

[26] The Commission changed the location of existing 700 MHz Guard Band licenses, provided for a 1-megahertz shift of the other commercial blocks in the Upper 700 MHz band and in the spectrum allocated to public safety, and reduced the size of the Guard Band B Block to make two additional megahertz of commercial spectrum available for auction. *700 MHz Second Report and Order*, 22 FCC Rcd at 15292-93, ¶ 3. In addition, the Commission afforded all Guard Band A Block licensees the same technical rules that apply to the adjacent commercial spectrum and the ability to deploy cellular architectures. *Id.* at 15294, ¶ 9.

[27] *See 700 MHz Second R&O*, 22 FCC Rcd at 15361, ¶ 195.

[28] *See id.* at 15360, ¶ 206.

[29] *Id.*

[30] *See* Service Rules for the 698-746, 747-762 and 777-792 Bands; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, *Second Further Notice of Proposed Rulemaking*, 23 FCC Rcd 8047, 8052 ¶ 8 (2008) (*700 MHz Second Further Notice*).

[31] *See 700 MHz Second Report and Order*, 22 FCC Rcd at 15295, ¶ 13.

2008.[32] The auction concluded with provisionally winning bids covering 1091 licenses. While the bids for licenses associated with four of the five 700 MHz Band blocks (the A, B, C, and E Blocks) exceeded the applicable reserve prices, bids for the fifth block (the D Block) license did not meet the reserve price and thus, there was no winning bid in Auction 73 for that license. Accordingly, the Auction 73 winning bids totaled $19,120,378,000 and the net winning bids (reflecting bidders' claimed bidding credit eligibility) totaled $18,957,582,150.[33]

12. The total 84 megahertz of commercial spectrum in the 700 MHz band will generally be available for a broad range of flexible uses.[34] This spectrum has many permissible uses: new licensees may use the spectrum for fixed, mobile (including mobile wireless commercial services), and broadcast services.[35] In addition, the Commission optimized the power rules in the remaining paired spectrum specifically for mobile use.[36] The Commission expects that many of the new technologies to be developed and deployed in this band will support advanced wireless applications.[37]

13. Because the auction of the D Block did not result in a winning bid, on May 14, 2008, the Commission issued the *700 MHz Second Further Notice*, revisiting the rules governing the D Block licensee, the mandatory public/private partnership, and the Public Safety Broadband Licensee.[38] The Commission sought comment broadly on how it might modify those rules to achieve the goal of a nationwide, interoperable public safety network, whether it should continue to mandate a public/private partnership between the D Block licensee and Public Safety Broadband Licensee, and if so, under what terms and conditions.[39]

14. On September 25, 2008, the Commission adopted the *700 MHz Third Further Notice* that proposed licensing the D Block spectrum as part of a revised 700 MHz Public/Private Partnership, with modifications to the rules governing both the D Block and the Public Safety Broadband License, in order to maximize the public safety and commercial benefits of a nationwide, interoperable broadband network in the 700 MHz band.[40] Although the D Block proceeding still is pending, the recent National Broadband

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[32] FCC, *Auction* 73, http://wireless.fcc.gov/auctions/73 (visited Sept. 18, 2008).

[33] "Auction of 700 MHz Band Licenses Closes," *Public Notice*, 23 FCC Rcd 4572, 4572-73 ¶ 2 (2008).

[34] *See Lower 700 MHz Report and Order*; Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Third Report and Order*, 16 FCC Rcd 2703 (2001); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Second Memorandum Opinion and Order*, 16 FCC Rcd 1239 (2001); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 20845 (2000); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *Second Report and Order*, 15 FCC Rcd 5299 (2000) (*Upper 700 MHz Second Report and Order*); *700 MHz Second R&O*; *700 MHz Report and Order*. The 82 megahertz of spectrum does not include the reconfigured Guard Band B Block spectrum at 775-776/805-806 MHz. *See 700 MHz Second R&O*, 22 FCC Rcd at 15294 ¶ 9, 15388-89 ¶¶ 266-69.

[35] *See generally id.* In addition, in February 2010, the Commission sought comment on a petition for rulemaking requesting that the Commission require that all mobile units for the 700 MHz band be capable of operating over all frequencies in the band. "Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding 700 MHz Band Mobile Equipment Design and Procurement Practices," RM-11592, *Public Notice*, 25 FCC Rcd 1464 (WTB 2010).

[36] *See 700 MHz Report and Order*, 22 FCC Rcd at 8067-68, ¶ 6.

[37] *See, e.g., Lower 700 MHz Report and Order*, 17 FCC Rcd at 1032, ¶ 20.

[38] *See 700 MHz Second Further Notice*, 23 FCC Rcd at 8047.

[39] *Id.* The Commission also indicated that, prior to adopting final rules, it would present for public comment a detailed proposal regarding specific proposed rules to address these issues. *Id.* at 8052, ¶ 7.

[40] *See generally* Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, (continued....)